# SBIR/STTR Programs

## Small Business Innovation Research
## Small Business Technology TRansfer

**Byron Jackson**

**SBIR Program Office**
**NASA Jet Propulsion Laboratory**

**March 5, 2013**

# Agenda

- Federal SBIR/STTR Program – An Opportunity
- Information on 11 Agency Programs
- NASA SBIR Program Description
- What Are My Chances?
- How Should I Proceed?
- Proposal Submission and Selection

# SBIR/STTR Program Basics

- Congressionally mandated programs to increase U.S. competiveness, create job growth, drive technical innovation, and encourage commercialization
- Programs open door to small business participation in Federal research and development programs
- Federal agencies with significant R&D budgets must set aside part of this funding for small businesses
- Congress recently reauthorized SBIR/STTR Program through 2017, reflecting strong political support
- At this time, approximately $2.4 billion a year is invested in the program

# SBIR/STTR Program Funding

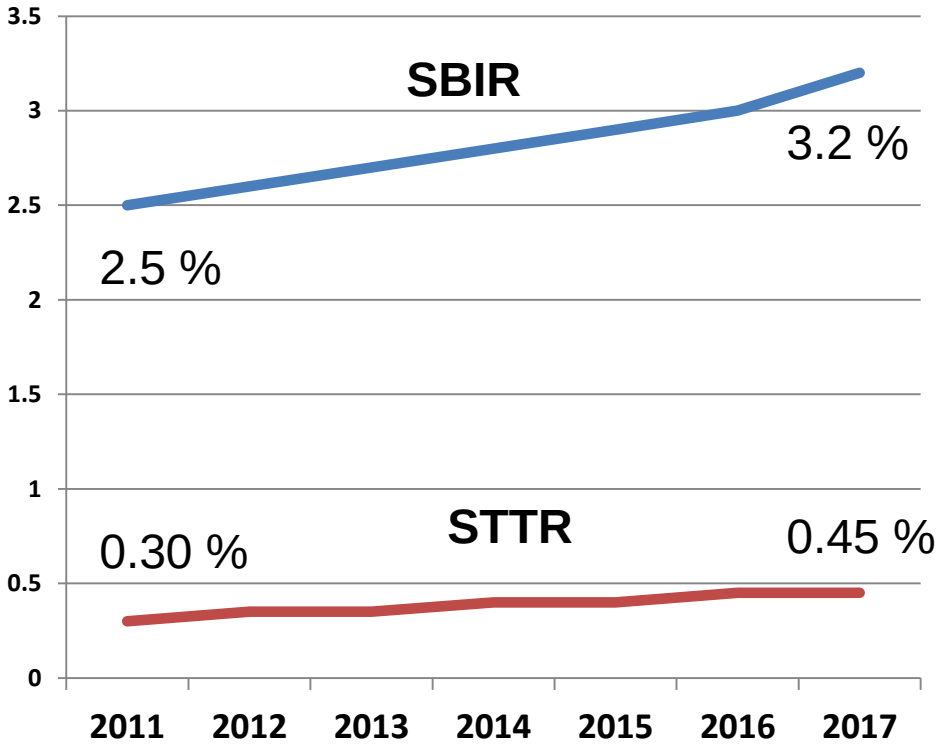
Federal agencies with an extramural R&D budget of over **$100M** participate in the **SBIR** Program

Federal agencies with an extramural R&D budget of over **$1B** participate in the **STTR** Programs

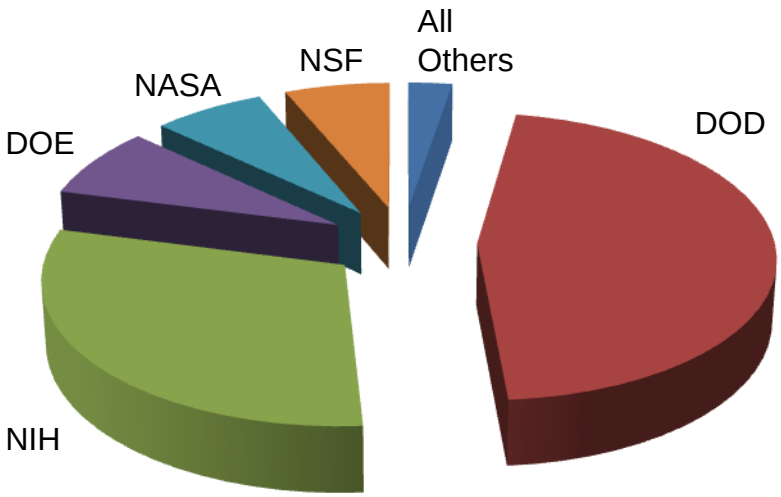
Recent reauthorization required Federal agencies to increase their contribution through 2017

Extramural budget is agency R&D (including FFRDCs and contractor operated facilities) less funds for government owned and operated facilities

**Funding Growth Under Program Reauthorization**



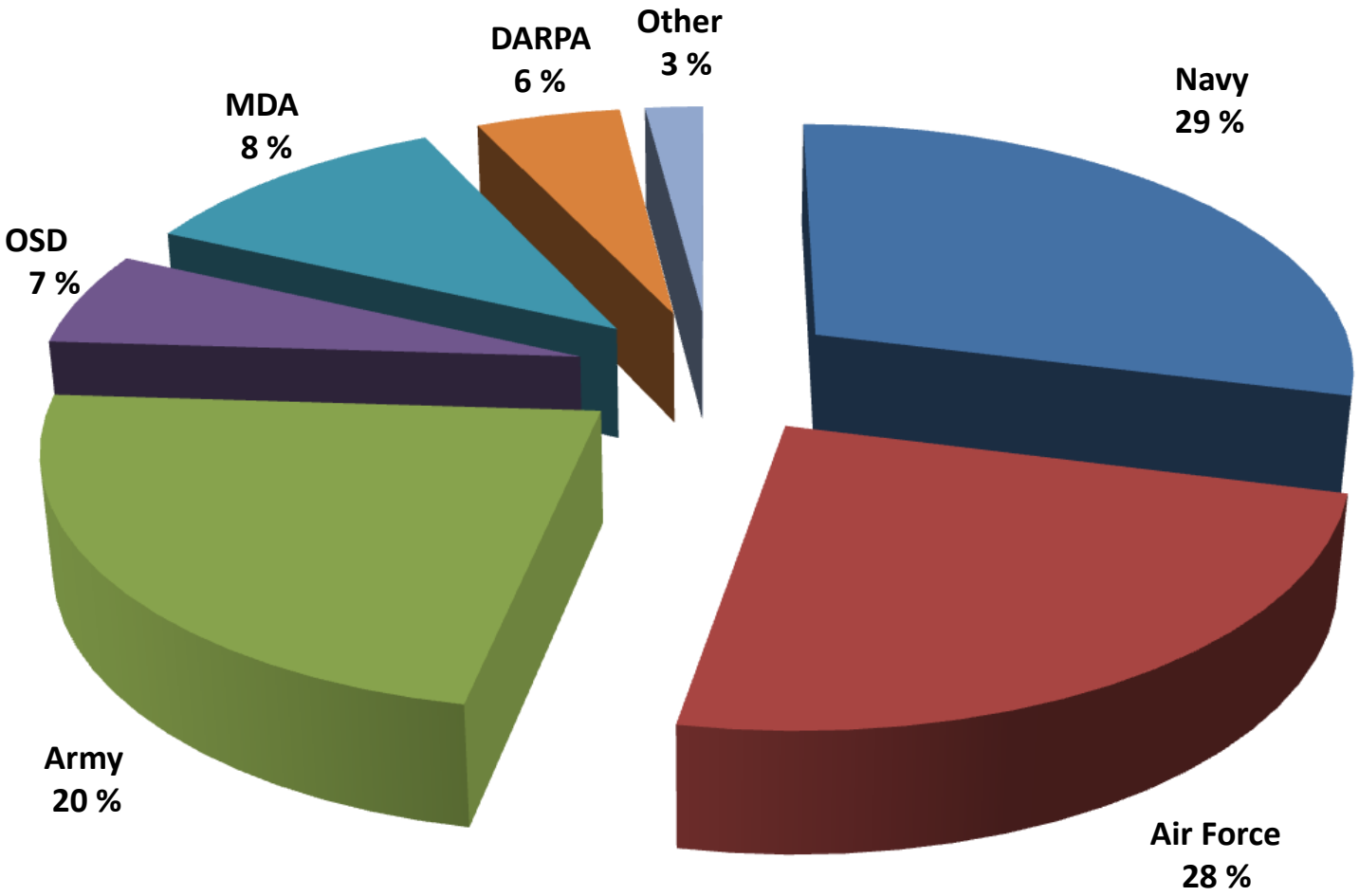
# SBIR/STTR Agency Funding 2012, $2.4 Billion




| Agencies with SBIR and STTR Programs | |
|---|---|
| Department of Defense (DOD) | $1.1 B |
| Department of Health and Human Services: National Institute of Health (NIHH) | $717.0 M |
| Department of Energy (DOE) | $188.3 M |
| National Aeronautics and Space Administration (NASA) | $161.8 M |
| National Science Foundation (NSF) | $150.6 M |
| **Agencies with SBIR Programs** | |
| US Department of Agriculture (USDA) | $19.3 M |
| Department of Education (ED) | $13.4 M |
| Department of Homeland Security (DHS): Science and Technology Directorate (S&T) and Domestic Nuclear Detection Office (DNDO) | $12.6 M |
| Department of Transportation (DOT) | $8.6 M |
| Environmental Protection Agency (EPA) | $4.8 M |
| Department of Commerce: National Oceanic and Atmospheric Administration (NOAA) and National Institute of Standards and Technology (NIST) | $4.7 M |

Source: US Department of Energy, SBIR/STTR Program Office

# DoD SBIR Program (2010)



# Three Phase Programs*

| | NASA SBIR | NASA STTR |
|---|---|---|
| **Phase I (2012)** | 6 months | 12 months |
| Project Feasibility | up to $125K | up to $125K |
| | select $200k | |
| **Phase II (2012)** | 2 years | 2 years |
| Research & | up to $750K | up to $750K |
| Development | select $1,500K | |
| **Phase III** | | |
| Commercialization | non-SBIR/non-STTR funds | |

* Duration and funding limits are variable by agency.

# Agency Programs Vary Significantly

- Size of Phase I and Phase II awards vary over a wide range
- Different funding levels available in many cases
- Additional awards when company obtains matching funds from another source
- Fast Track Programs that speed up process for selected contracts
- Availability of commercialization assistance
- More than one solicitation a year

# SBIR/STTR Solicitation Upcoming Dates

| Agency | Release Dates | Accept Dates | Closing Dates |
|---|---|---|---|
| DoD SBIR | April 24, 2013 | May 24, 2013 | June 26, 2013 |
| DoD SBIR | July 26, 2013 | August 26, 2013 | September 25, 2013 |
| DoD STTR | January 25, 2013 | February 25, 2013 | August 29, 2013 |
| DoD STTR | July 26, 2013 | August 26, 2013 | September 25, 2013 |
| DoE Release 1[1] | July 15, 2013 | August 12, 2013 | October 15, 2013 |
| DoE Release 2[1] | October 28, 2013 | November 25, 2013 | February 4, 2014 |
| HHS/NIH SBIR/STTR AIDS | May 7, 2013 | September 7, 2013<br>January 7, 2014 | April 5, 2013<br>August 5, 2013<br>December 5, 2013 |
| NASA SBIR/STTR | November 2013[2] | November 2013[2] | January 2014[2] |

1. DoE begins with topic release, funding opportunity announcement, letter of intent followed by application due.
2. Date are tentative.

# SBIR/STTR Solicitation Upcoming Dates

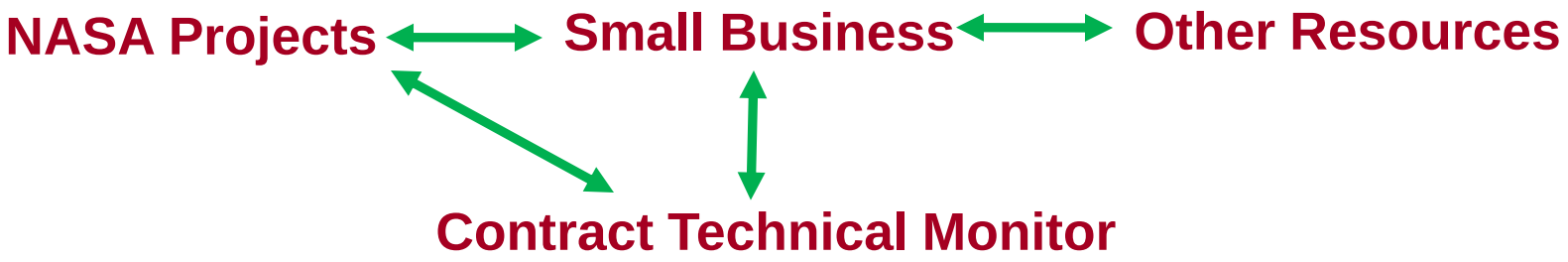
| Agency | Release Dates | Accept Dates | Closing Dates |
|---|---|---|---|
| NSF SBIR | March 11, 2013 | March 11, 2013 | Jun 11, 2013 |
| NSF SBIR | September, 2013 | September, 2013 | December, 2013 |
| EPA SBIR | Mid-March, 2013 | Mid-March, 2013 | September 25, 2013 |
| DOT STTR | June 20, 2013 | June 20, 2013 | August 29, 2013 |
| ED SBIR | December, 2013 | December, 2013 | May, 2013 |
| DOC NIST | Early Dec., 2013 | Early Dec., 2013 | Mid-March, 2014 |
| DOC NOAA | Mid-November, 2013 | Mid-November, 2013 | Mid-January, 2014 |
| USDA SBIR | June , 2013 | June, 2013 | September 26, 2013 |

# NASA Participating Centers

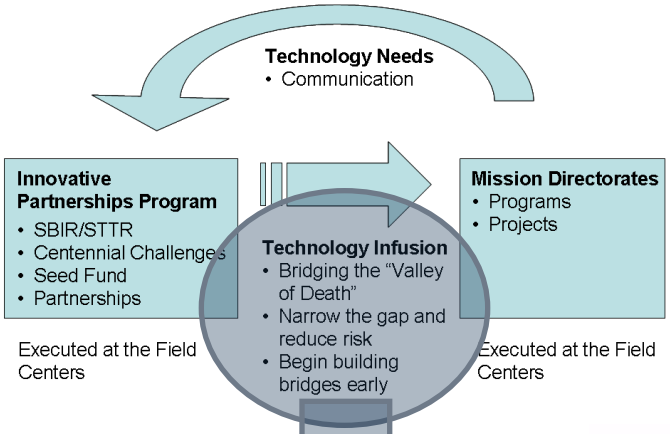
# http://www.nasa.gov/offices/oct/home/index.html

# NASA Has an Active Infusion Effort

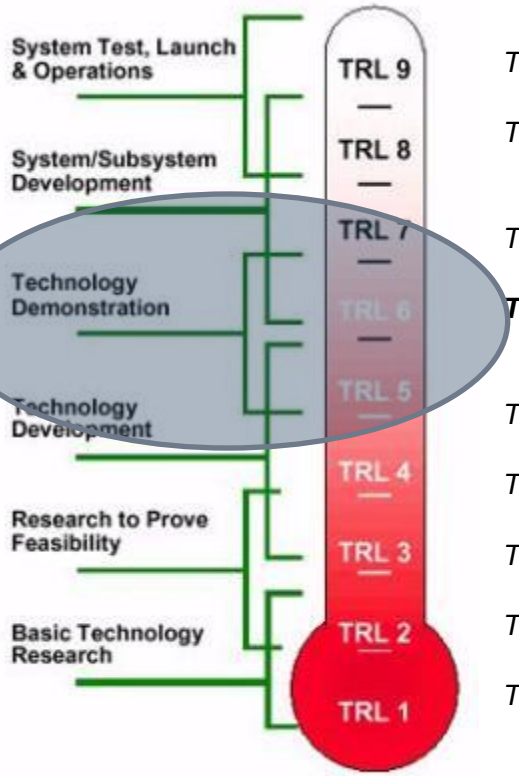
- Each NASA center has a technology infusion manager
- Insures that programs and projects at each center are aware SBIR/STTR technology developments
- Insure that SBIR/STTR companies have information they need on technology developments within NASA
- Assist SBIR/STTR companies in taking advantage of additional NASA funding opportunities



# Technology Demonstration is critical to Infusion




- **As a rule of thumb, projects like technology to be at Technology Readiness Level (TRL) 6 by PDR**
- **Technology Demonstration in relevant environments is critical**

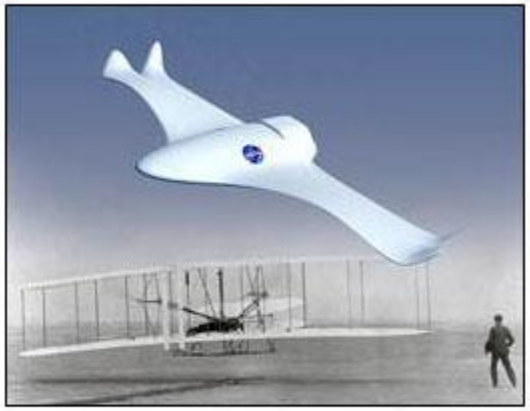



| | |
|---|---|
| *TRL 9* | Actual system "flight proven" through successful mission operations. |
| *TRL 8* | Actual system completed and "flight qualified" through test and demonstration (ground or space). |
| *TRL 7* | System prototype demonstration in a ***space environment***. |
| ***TRL 6*** | System/subsystem model or prototype demonstration in a ***relevant environment*** (ground or space). |
| *TRL 5* | Component and/or breadboard validation in ***relevant environment***. |
| *TRL 4* | Component and/or breadboard validation in laboratory environment. |
| *TRL 3* | Analytical and experimental critical function and/or characteristic proof-of concept. |
| *TRL 2* | Technology concept and/or application formulated. |
| *TRL 1* | Basic principles observed and reported. |

# Mission Driven

**Mission Directorates Are Actively Involved in Solicitation Development and Proposal Selection**

Aeronautics



Human Explorations and Operations

Science

# 2012 Aeronautics Research Topics

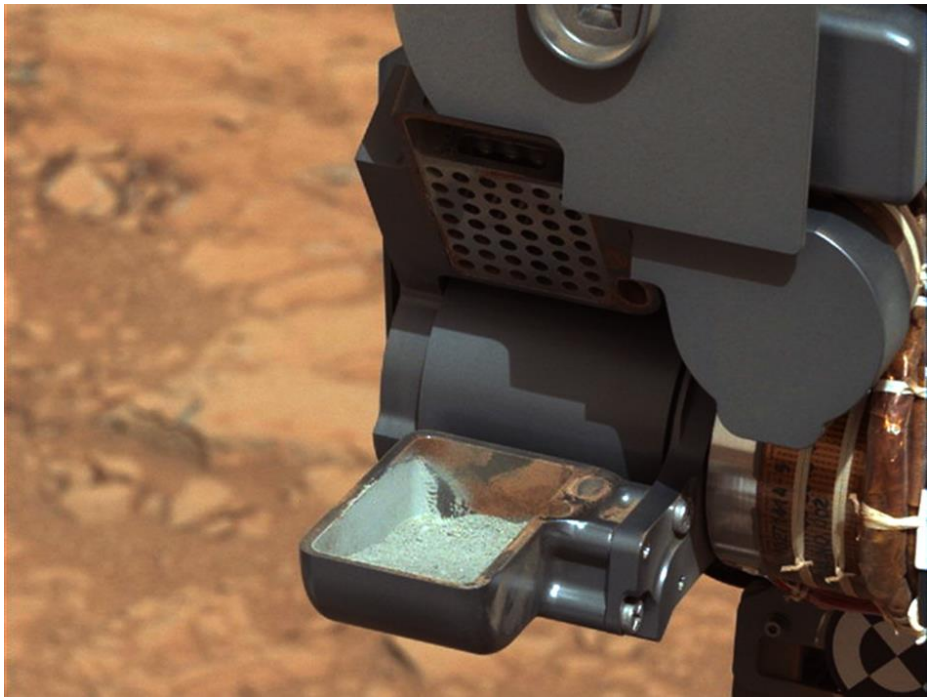
- **Aviation Safety**
- **Air Traffic Management Research and Development**
- **Air Vehicle Technologies**

# 2012 Human Exploration and Operations Topics

- In Situ Resource Utilization
- Space Transportation
- Life Support and Habitation Systems
- Extra-Vehicular Activity Technology
- Lightweight Spacecraft Materials and Structures
- Autonomous and Robotic Systems
- Entry, Descent, and Landing (EDL) Technology
- High-Efficiency Space Power Systems
- Space Communications and Navigation
- Ground Processing and ISS Utilization
- Radiation Protection
- Human Research and Health Maintenance

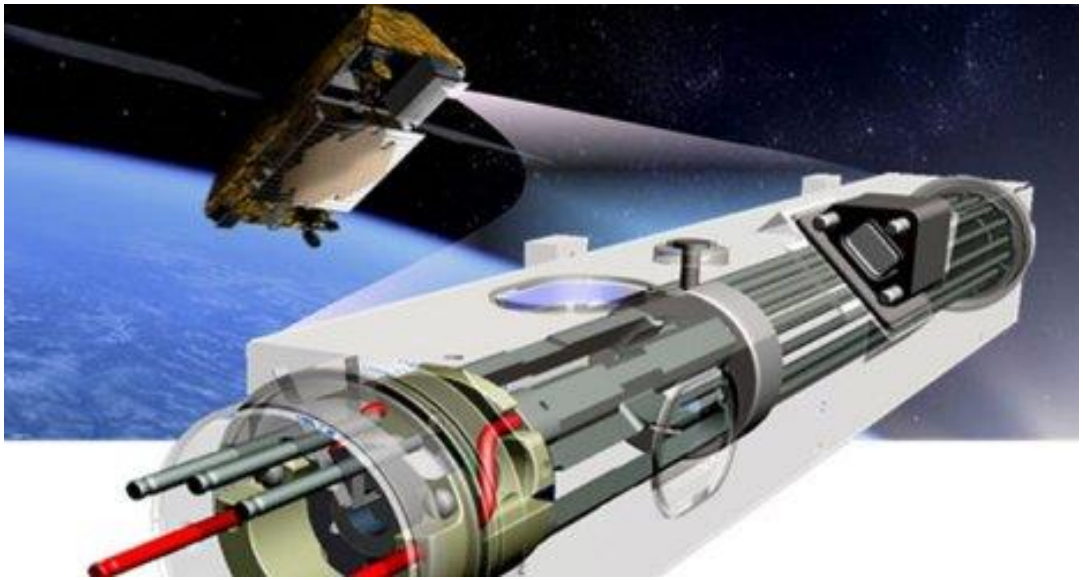
# 2012 Science Topics

- Sensors, Detectors, and Instruments
- Advanced Telescope Systems
- Spacecraft and Platform Subsystems
- Low-Cost Small Spacecraft and Technologies
- Robotic Exploration Technologies
- Information Technologies



# 2012 STTR Subtopics - 1

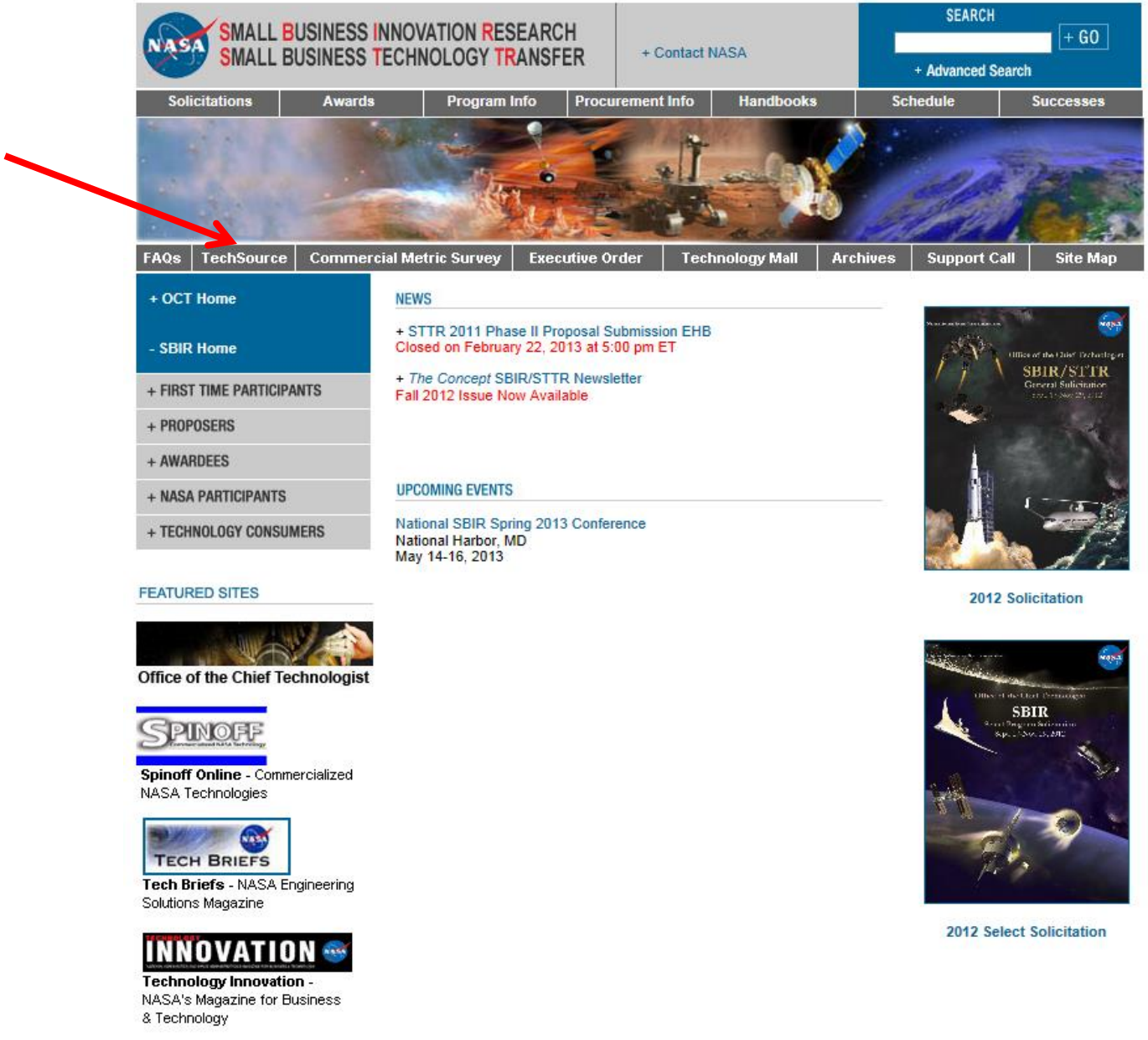
- Launch Propulsion Systems
- In-space Propulsion Technologies
- Space Power and Energy Storage
- Robotics, Tele-Robotics and Autonomous Systems
- Communication and Navigation
- Human Health, Life Support and Habitation Systems



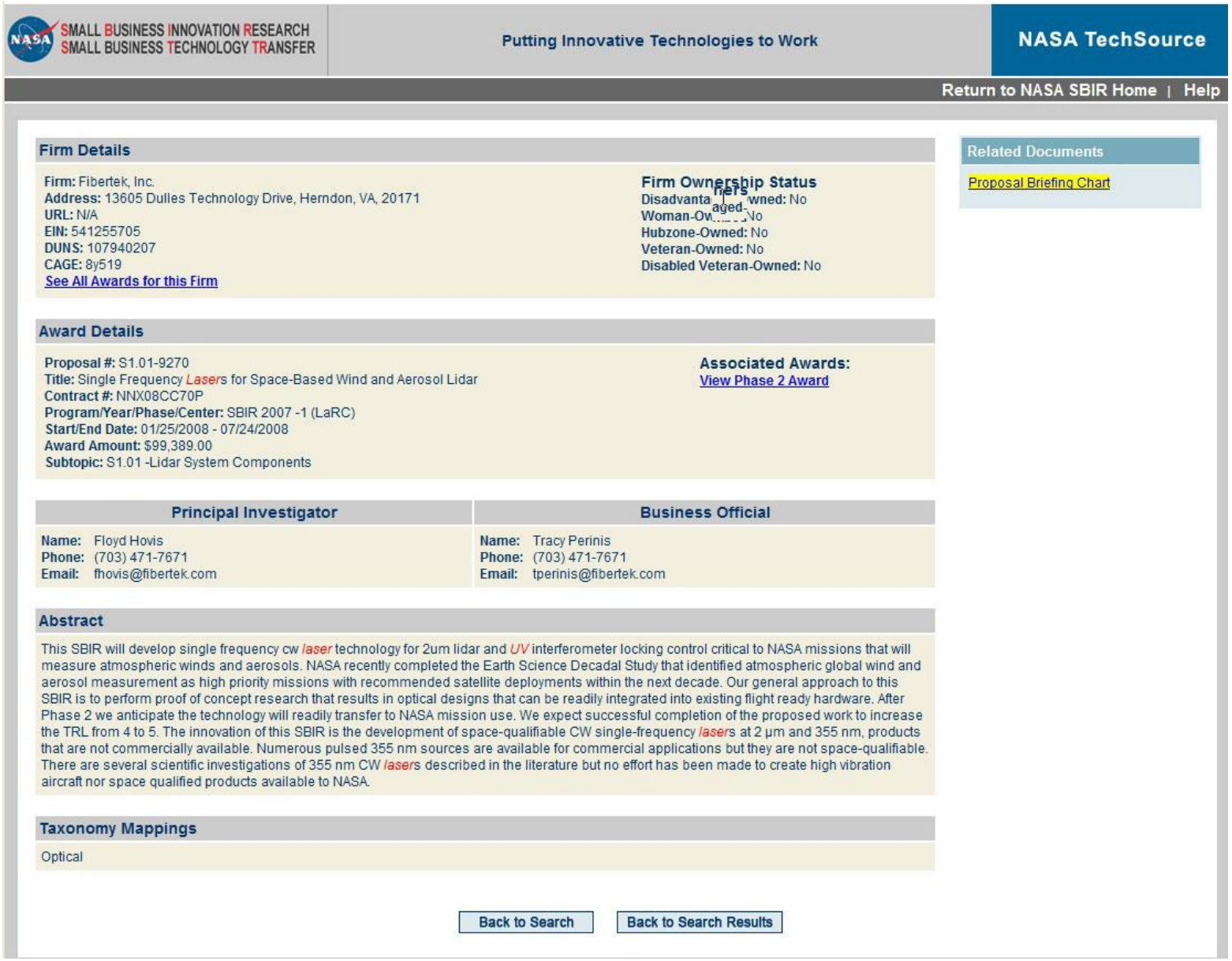
# 2011 STTR Subtopics - 2

- Science Instruments, Observatories and Sensor Systems
- Entry, Descent and Landing Systems
- Nanotechnology
- Modeling, Simulation, Information Technology and Processing
- Materials, Structures, Mechanical Systems and Manufacturing
- Ground and Launch Systems Processing
- Cross-cutting Aeronautics

# NASA SBIR/STTR Homepage



# NASA TechSource



SMALL BUSINESS INNOVATION RESEARCH
SMALL BUSINESS TECHNOLOGY TRANSFER

Putting Innovative Technologies to Work

NASA TechSource

Return to NASA SBIR Home | Help

## Firm Details

**Firm:** Fibertek, Inc.
**Address:** 13605 Dulles Technology Drive, Herndon, VA, 20171
**URL:** N/A
**EIN:** 541255705
**DUNS:** 107940207
**CAGE:** 8y519
See All Awards for this Firm

**Firm Ownership Status**
**Disadvanta[illegible]wned:** No
**Woman-Ow[illegible]:** No
**Hubzone-Owned:** No
**Veteran-Owned:** No
**Disabled Veteran-Owned:** No

## Related Documents

Proposal Briefing Chart

## Award Details

**Proposal #:** S1.01-9270
**Title:** Single Frequency *Laser*s for Space-Based Wind and Aerosol Lidar
**Contract #:** NNX08CC70P
**Program/Year/Phase/Center:** SBIR 2007 -1 (LaRC)
**Start/End Date:** 01/25/2008 - 07/24/2008
**Award Amount:** $99,389.00
**Subtopic:** S1.01 -Lidar System Components

**Associated Awards:**
View Phase 2 Award

## Principal Investigator

**Name:** Floyd Hovis
**Phone:** (703) 471-7671
**Email:** fhovis@fibertek.com

## Business Official

**Name:** Tracy Perinis
**Phone:** (703) 471-7671
**Email:** tperinis@fibertek.com

## Abstract

This SBIR will develop single frequency cw *laser* technology for 2um lidar and *UV* interferometer locking control critical to NASA missions that will measure atmospheric winds and aerosols. NASA recently completed the Earth Science Decadal Study that identified atmospheric global wind and aerosol measurement as high priority missions with recommended satellite deployments within the next decade. Our general approach to this SBIR is to perform proof of concept research that results in optical designs that can be readily integrated into existing flight ready hardware. After Phase 2 we anticipate the technology will readily transfer to NASA mission use. We expect successful completion of the proposed work to increase the TRL from 4 to 5. The innovation of this SBIR is the development of space-qualifiable CW single-frequency *laser*s at 2 µm and 355 nm, products that are not commercially available. Numerous pulsed 355 nm sources are available for commercial applications but they are not space-qualifiable. There are several scientific investigations of 355 nm CW *laser*s described in the literature but no effort has been made to create high vibration aircraft nor space qualified products available to NASA.

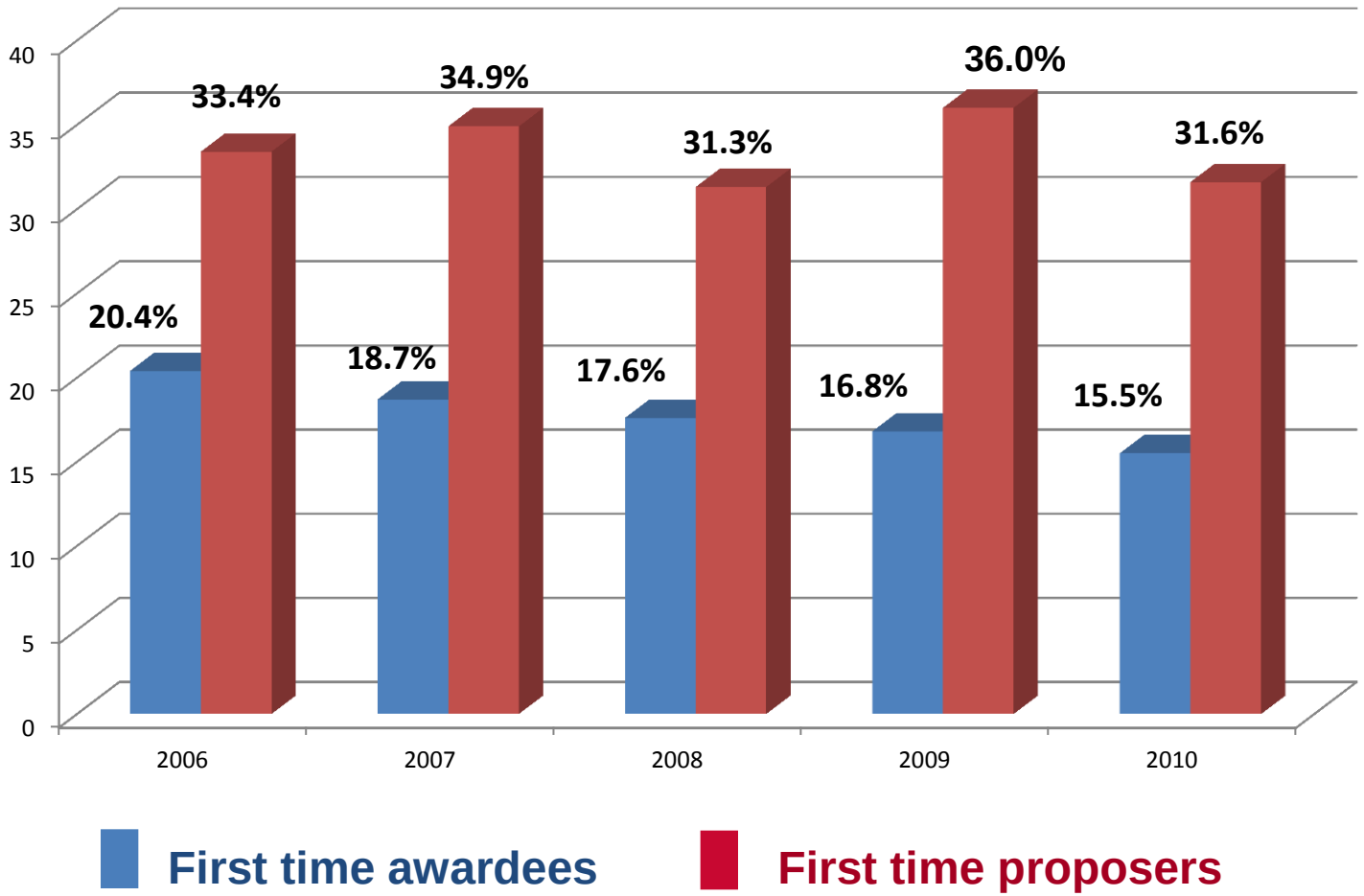
## Taxonomy Mappings

Optical

Back to Search | Back to Search Results

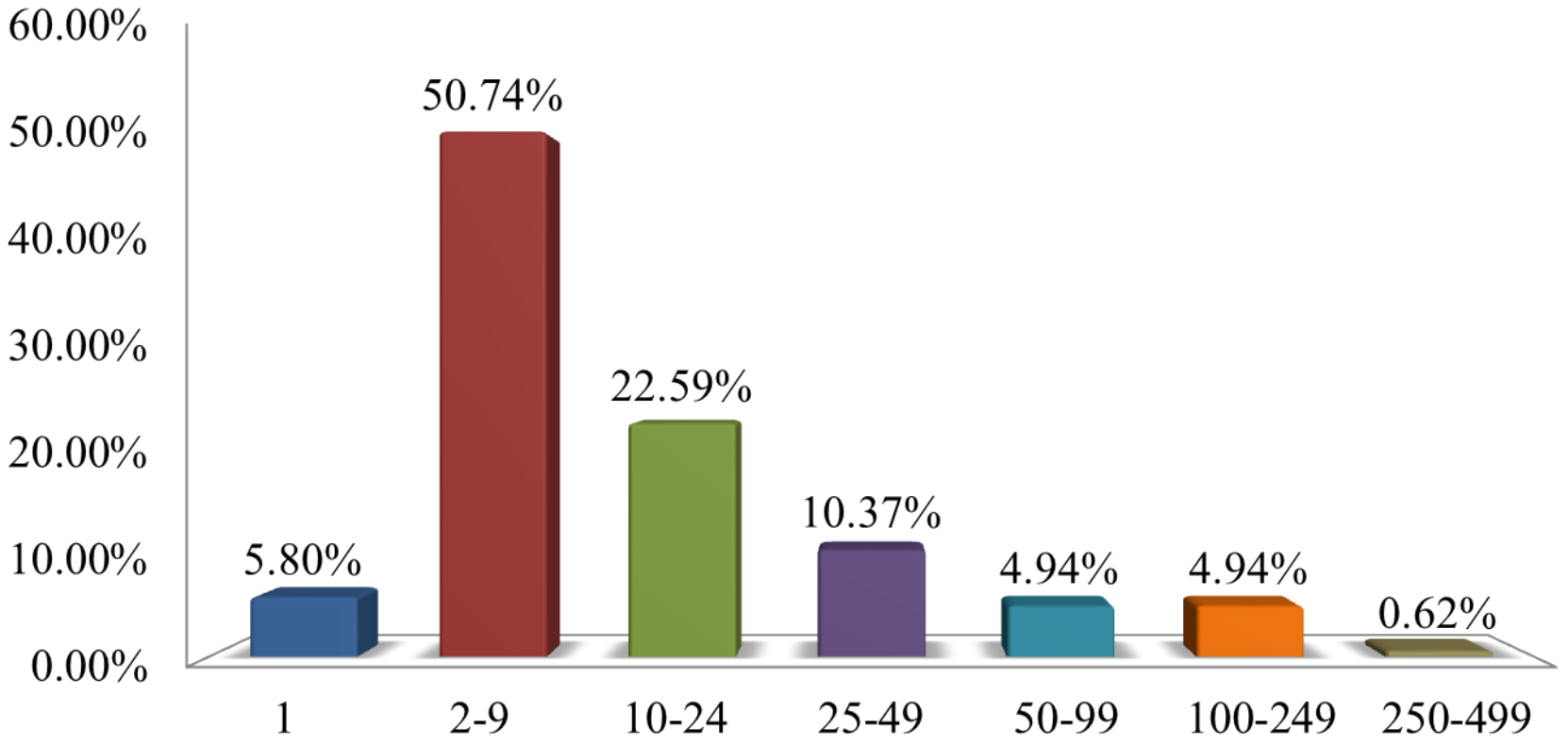
# What Are My Chances ?

# First Time Awardees and First Time Proposers to NASA SBIR/STTR



# SBIR Participants

- ✓ **Firms are typically small and new to the program**
- ✓ **About 1/3 are first-time Phase I awardees**




**Number of Employees NASA SBIR Phase I 2009**

# Innovation – Exploiting New Findings

**Surface Optics** – Successfully took a new mirror silver coating process developed at Lawrence Livermore Laboratories and applied it in a deposition reactor for large mirrors

**Starsys Research** – Evaluated new materials, manufacturing process steps, and design principles to arrive at a better planetary gearbox

**GrammaTech** – Expanded capability of primary commercial software product to meet NASA's needs for validating new software

# NASA SBIR Contributions to the Mars Science Laboratory

**Grammatech -** Software for eliminating defects in mission-critical and embedded software applications directing rover operations

**Starsys Research** - Planetary gearboxes for the articulated robotic arm and the descent braking mechanism for controlling rate of descent to planetary surface

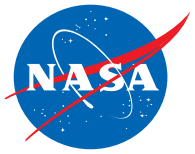
**Creare -** A space-qualified vacuum pump for the Sample Analysis at Mars (SAM) instrument package

*The Mars Science Laboratory Curiosity Begins its Scientific Investigation on Mars Surface*

**Yardney Technical Products –** Lithium ion batteries that enable the power system to meet peak power demands or rover activities

**Honeybee Robotics –** Dust removal tool used to remove the dust layer from rock surfaces and to clean the rover's observation tray and designed the sample manipulation system for the Sample Analysis at Mars (SAM) instrument package

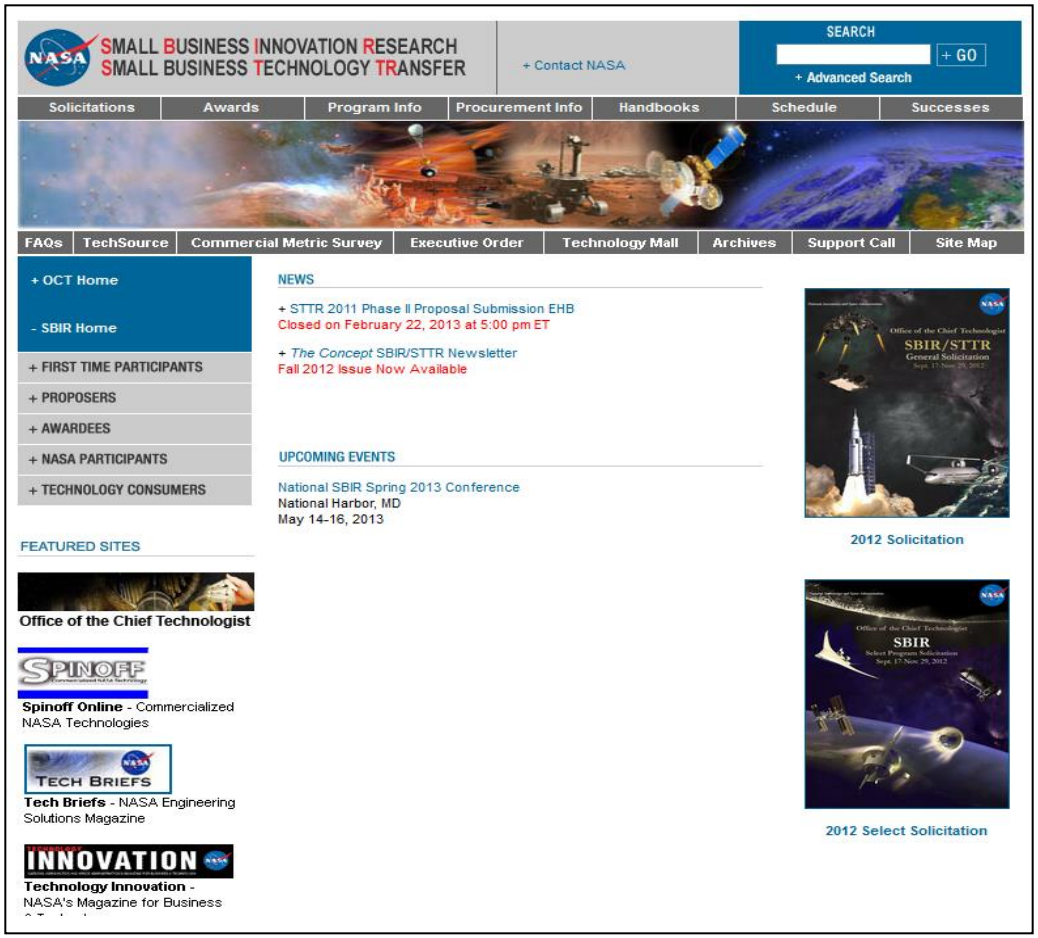
**inXitu–** Features of their automated sample handling system are implemented in the Chemistry and Mineralogy experiment (CheMin) instrument




# How Should I Proceed ?

# NASA SBIR/STTR

- Visit NASA SBIR/STTR website: [www.sbir.nasa.gov](http://www.sbir.nasa.gov)
- Review prior program solicitations, awards, technical abstracts, procurement information
- Prior success stories and success story videos



# Inherent Challenges of Space Systems

- **Surviving Launch Conditions: high g-load, vibration, payload fairing, deployment**
- **Functioning in Extreme Environments: radiation, temperature, gravity, vacuum**
- **Limiting Power Availability**
- **High Degree of Autonomy and Reliability**
- **Long Range Communication and Navigation**

# Path to a Winning Proposal



- **Review prior year solicitation:**
  **http://sbir.nasa.gov/**
- **Search and identify specific technical areas (subtopics) and lead center(s) of your interest**
- **Request subject matter expert contact information from respective field center program POCs**
- **E-mail/Call technical POCs and initiate dialogues**

- **Learn technology needs, priorities, and funding gaps**
- **Visit and brief NASA on your companies capabilities, if the opportunity presents itself**

# SBIR/STTR Center Points of Contact - 1

- **Ames Research Center (ARC)**
- **Ryszard Pisarski, 650-604-0149, Ryszard.L.Pisarski@nasa.gov**
- **Kim Hines, 650-604-5582, Kimberly.K.Hines@nasa.gov**

- **Dryden Flight Research Center (DFRC)**
- **Yohan Lin, 661-276-3155, Yohan.Lin@nasa.gov**

- **Glenn Research Center (GRC)**
- **Gynelle Steele, 216-433-8258,Gynelle.C.Steele@nasa.gov (ARMD)**
- **Hung Nguyen, 216-433-6590, Hung.D.Nguyen@nasa.gov**
- **Dean Bitler, 216-433-2226, Dean.W.Bitler@nasa.gov**

- **Goddard Space Flight Center (GSFC)**
- **Cynthia Firman, 301-286-0886, Cynthia.M.Firman@nasa.gov**

- **Jet Propulsion Laboratory (JPL)**
- **Carol Lewis, 818-354-3767, Carol.R.Lewis@jpl.nasa.gov**
- **Richard Terrile, 818-354-6158, Richard.J.Terrile@jpl.nasa.gov (SMD)**
- **Byron Jackson, 818-354-1246, Byron.L.Jackson@jpl.nasa.gov**

- **Johnson Space Center (JSC)**
- **Kathy Packard, 281-244-5378, Kathryn.B.Packard@nasa.gov**

# SBIR/STTR Center Points of Contact - 2

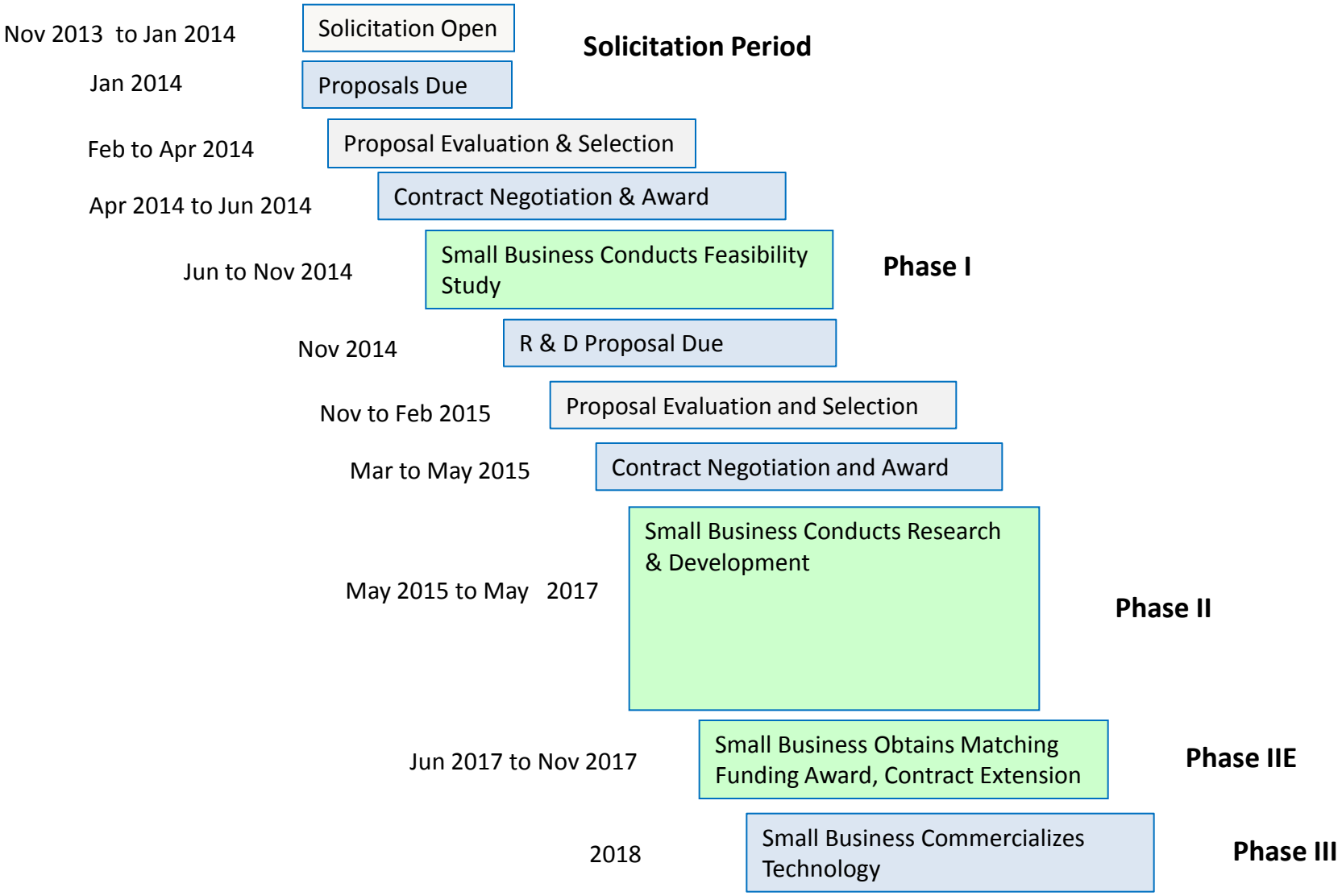
- Kennedy Space Center (KSC)
- Brenda Penn, 321-861-3720, Brenda.A.Penn@nasa.gov

- Langley Research Center (LaRC)
- Bob Yang, 757-864-8020, Robert.L.Yang@nasa.gov (ESMD)
- Kimberly Graupner, 757-864-8618, Kimberly.E.Graupner@nasa.gov

- Marshall Space Flight Center (MSFC)
- Lynn Garrison, 256-544-6719, Virginia.B.Garrison@nasa.gov

- Stennis Space Center (SSC)
- Thomas Stanley, 228-688-7779, Thomas.M.Stanley@nasa.gov

# NASA SBIR 2012 Process Scenario



# Proposal Submission

# SBIR – Eligibility Checkpoints

- Organized for-profit U.S. small business (500 or fewer employees)
- At least 51% U.S. owned and independently operated
- Small business located in the U.S.
- P.I.'s primary employment must be with small business during the project
- For Phase I, no more than 1/3 of funding less profit can be subcontracted, 1/2 for Phase II

# STTR – Eligibility Checkpoints

- **Small business must perform a minimum of 40% of the work; research institution a minimum of 30%**
- **Research institution is a FFRDC, college or university, or non-profit research institution**
- **No size limit on research institution**
- **Small business must manage and control the STTR funding agreement**
- **Principal Investigator may be at the small business or research institution**

# Submission Process

- All proposals are submitted electronically via the internet
- Make sure all parts of your proposal are received on time – late proposals are rejected
- Proposals are screened for administrative completeness and turned over to the managing NASA Center for technical review

# Some Important Facts to Remember

- All required items of information must be contained in your proposal – carefully follow directions
- Eligibility is determined at time of award
- The PI is not required to have a Ph.D.
- The PI is required to have expertise to oversee project scientifically and technically
- Applications may be submitted to different agencies for similar work
- Awards may not be accepted from different agencies for duplicative projects
- Do not plan on using Government facilities unless they are not available in the private sector

# Proposal Review & Selection Criteria

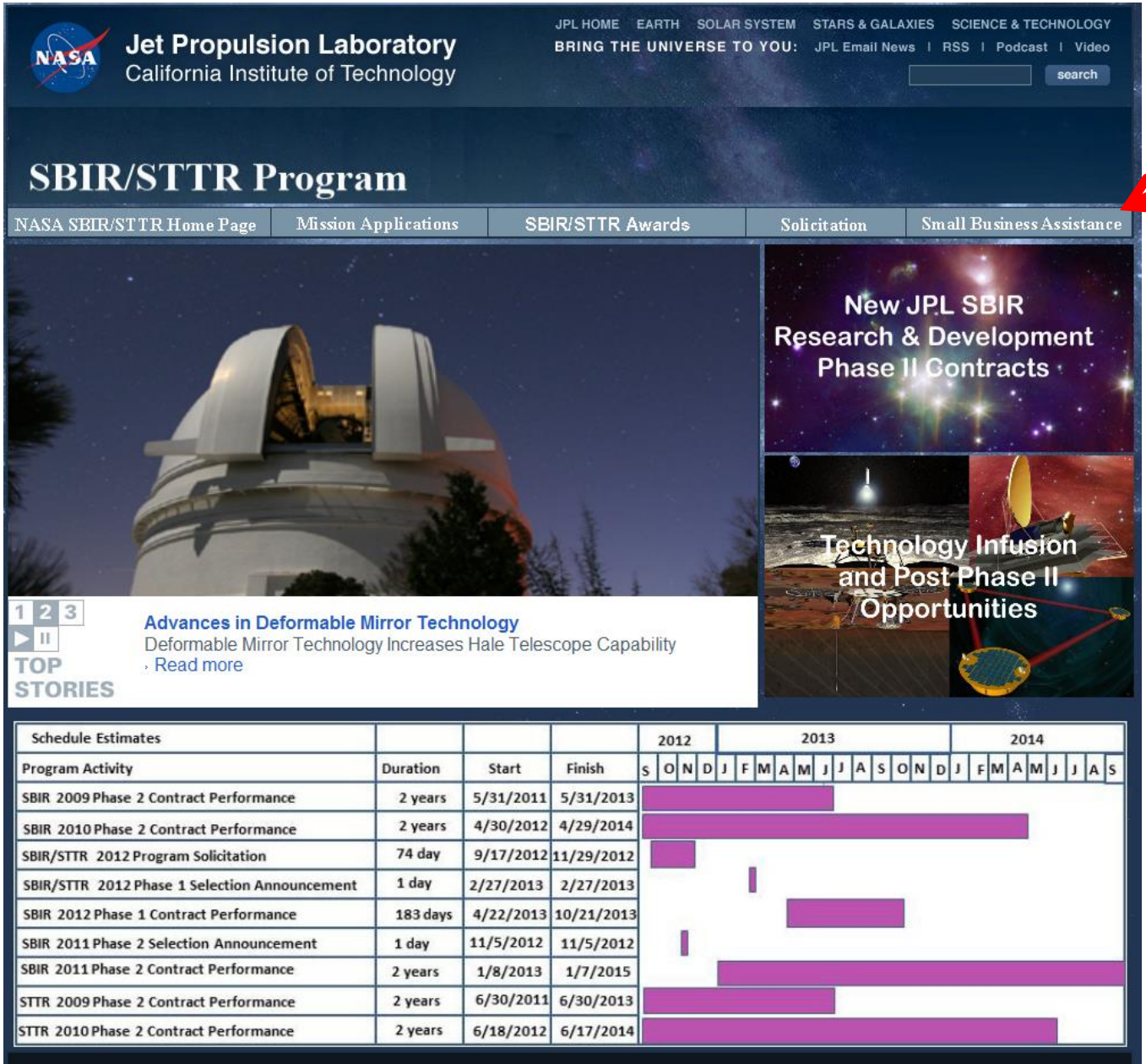
- **Proposal Review**
  - Factor 1: scientific/technical merit and feasibility (50%)
  - Factor 2: experience, qualifications and facilities (25%)
  - Factor 3: effectiveness of the proposed work plan (25%)
  - Factor 4: commercial merit and feasibility (adjectival)

- **Proposal Ranking and Selection**
  - NASA Project/Mission Alignment
  - Value, Priority and Infusion Potentials
  - Champion/Advocate

# Nature of NASA SBIR & STTR Contracts

- **SBIR contracts are fixed price contracts to be completed on a best effort basis**
- **Company will own resulting intellectual property (data, copyrights, patents, etc.)**
- **Government has royalty-free rights for government use of intellectual property**
- **Government protects data from public dissemination for four years after contract ends**

# Google JPL SBIR (http://sbir.jpl.nasa.gov)




| Schedule Estimates | | | | 2012 | | | | | | | | | | | | 2013 | | | | | | | | | | | | 2014 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Activity | Duration | Start | Finish | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | J | F | M | A | M | J | J | A | S | | | | | | | |
| SBIR 2009 Phase 2 Contract Performance | 2 years | 5/31/2011 | 5/31/2013 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SBIR 2010 Phase 2 Contract Performance | 2 years | 4/30/2012 | 4/29/2014 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SBIR/STTR 2012 Program Solicitation | 74 day | 9/17/2012 | 11/29/2012 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SBIR/STTR 2012 Phase 1 Selection Announcement | 1 day | 2/27/2013 | 2/27/2013 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SBIR 2012 Phase 1 Contract Performance | 183 days | 4/22/2013 | 10/21/2013 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SBIR 2011 Phase 2 Selection Announcement | 1 day | 11/5/2012 | 11/5/2012 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SBIR 2011 Phase 2 Contract Performance | 2 years | 1/8/2013 | 1/7/2015 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STTR 2009 Phase 2 Contract Performance | 2 years | 6/30/2011 | 6/30/2013 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STTR 2010 Phase 2 Contract Performance | 2 years | 6/18/2012 | 6/17/2014 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

# Available Assistance

## Assistance for Small Businesses

JPL SBIR/STTR Program Office Technology Infusion Manager

Assistance identifying contacts, infusion opportunities and availble resources through the SBIR/STTR Program

California Small Business Development Centers

Provides business assistance to start-up & existing businesses

Other States

State support for small businesses including financial assistance, training and technical assistance

JPL Business Opportunities Office

JPL program designed to afford small business the opportunity to compete for contracts, and to place the maximum number of contracts for supplies and services with them.

California Manufacturing Technology Center (CMTC)

CMTC Provides manufacturing and distribution consulting services to improve California's Industrial base.

Venture Capital Information

Trade association that represents the U.S. venture capital industry.